

	1	2	3	4	5	6	7	8	9	10
A			POWER SYSTEMS NETWORK MANAGEMENT PROTECTION AND SUBSTATION AUTOMATION SYSTEMS WBS NO: S-13656					ABB AUTOMATION COMPANY LTD., 414, AL-KHARJ ROAD SECOND INDUSTRIAL CITY RIYADH-11383 K.S.A		
B										
C	CONTRACTOR : ABB Contracting Company									
	CLIENT : National Gridsa									
D	PROJECT : CONSTRUCTION OF NEW 132/13.8kV SS 8709 IN AL-KHARJ CITY									
	SUBSTATION : S/S 8709									
E	CONTRACT NO. : 11131113/00									
	TITLE : Logic Diagram – ACSE									
F										
G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		COVER SHEET		<div>الشركة الوطنية لنقل الكهرباء</div> <div> <b>نقل الكهرباء</b> National Grid sa</div>	
			DRAWN BY <u>RIZ</u> CHECKED BY <u>KVR</u>		132/13.2 kV AUTOCHANGEOVER SWITCHING EQUIPT=ACSE		INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.
	00	13 09	DATE STARTED <u>2.22.2013</u> DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY					SHT
	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u>					CONT.
					RIYADH SAUDI ARABIA		P	C421	CD-322961	00

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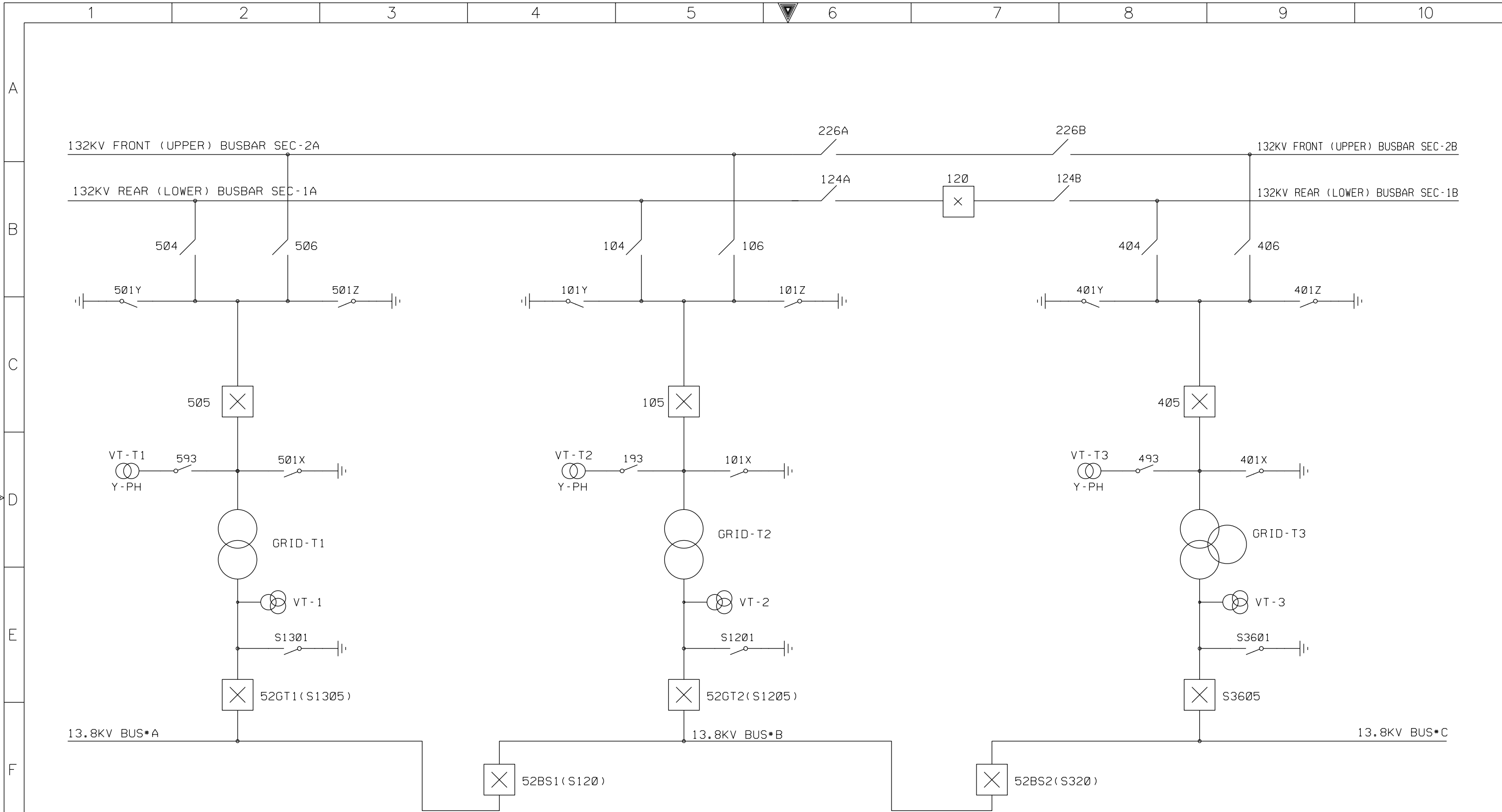

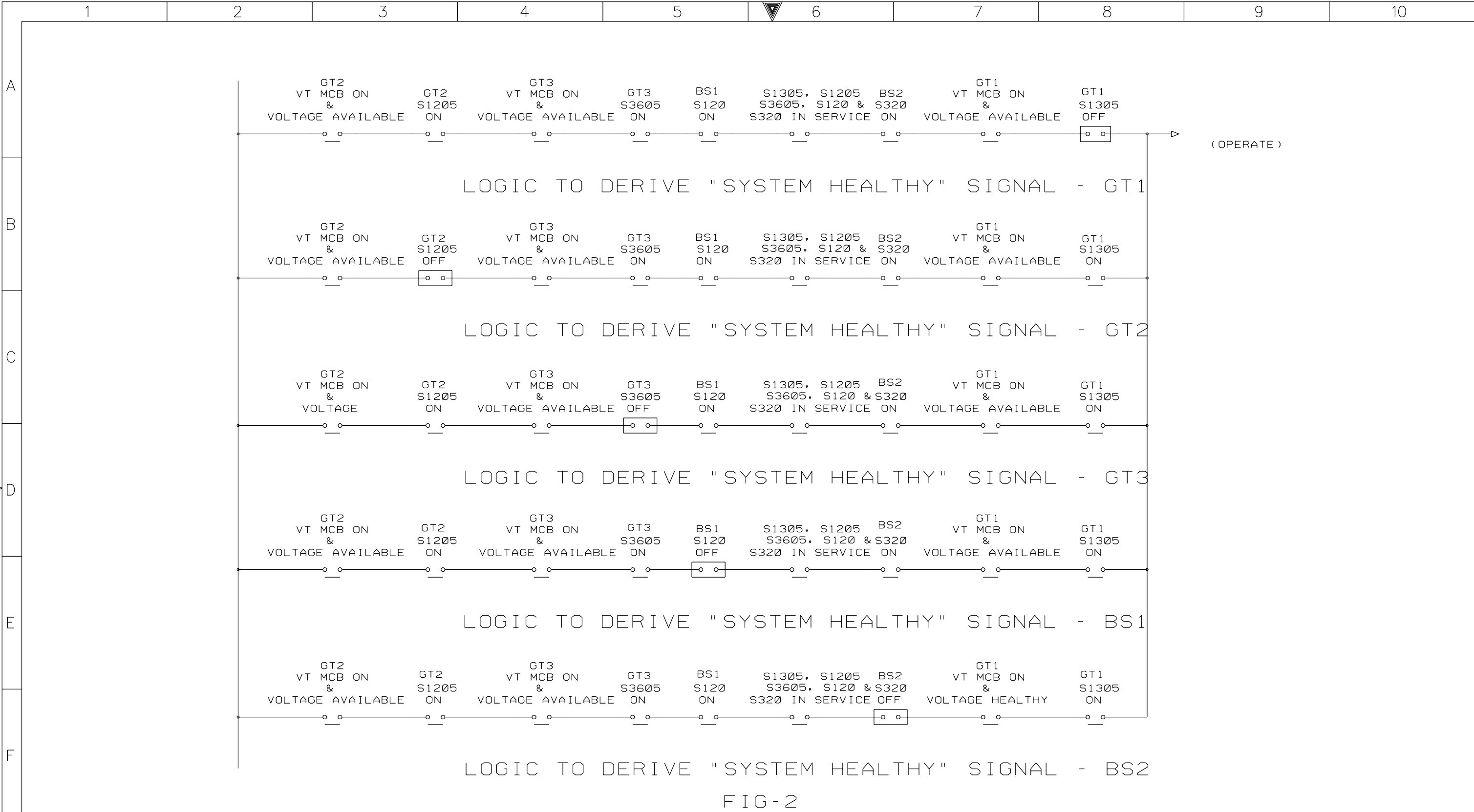


FIG - 1

G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		LOGIC DIAGRAM +ACSE/TOP		<div>الشركة الوطنية لنقل الكهرباء</div> <div> <b>نقل الكهرباء</b> National Grid sa</div>					
				DRAWN BY <u>RIZ</u> CHECKED BY <u>KVR</u>		132/13.2 kV AUTOCHANGEOVER SWITCHING EQUIPT=ACSE								
	<u>00</u>	<u>13 09</u>	FOR APPROVAL		DATE STARTED <u>2.22.2013</u> DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY		INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.		REV. NO.
	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u>		RIYADH SAUDI ARABIA					SHT	CONT.	
								P	C421	CD-322961	101	102	00	



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AS-BUILT BY \_\_\_\_\_ DATE \_\_\_\_\_

CONTRACT NO. 11131113/00

JOB ORDER NO. S-13656

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REV. NO.

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DATE

FOR APPROVAL

DESCRIPTION

DRAWN BY \_\_\_\_\_ RIZ \_\_\_\_\_ CHECKED BY \_\_\_\_\_ KVR

DATE STARTED 2.22.2013 DATE COMPLETED \_\_\_\_\_

OPRG. DEPT. \_\_\_\_\_ CTPD \_\_\_\_\_ ENG. DEPT. \_\_\_\_\_ AUT-PSAC


LOGIC DIAGRAM +ACSE/TOP

132/13.2 kV AUTOCHANGEOVER SWITCHING EQUIPT-ACSE

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء



نقل الكهرباء

National Grid sa

INDEX

PLANT NO.

DRAWING NUMBER

SHEET NO.

SHT

CONT.

REV. NO.

P

C421

CD-322961




102

104

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	1	2	3	4	5	6	7	8	9	10
A										
B	ACSE LOGIC (APPLICABLE FOR GT1-LVCB-S1305)									
C	THE STAND-BY TRANSFORMER (GT1) CAN BE BROUGHT IN ONLY IF THE FOLLOWING CONDITIONS ARE SATISFIED:									
	1. ACSE IS ' IN ' SERVICE AND									
	2. GT1-LVCB (S1305) IS OFF AND									
	3. GT1-MV SWGR-VT MCB ON & VOLTAGE AVAILABLE AND									
	4. GT1 - PROTN. TRIP RELAYS RESET AND									
	5. SEC-A STUCK BREAKER PROTECTION NOT OPERATED AND									
	6. ALL THE BREAKERS ARE IN SERVICE POSITION AND									
D	EITHER									
	1. GT3 - MV SWGR - VT MCB ON & VOLTAGE AVAILABLE & GT3 INCOMER BREAKER IS ON.									
	2. GT2 RECEIVES 'ACSE START' SIGNAL AND GT2 BREAKER IS OFF.									
	3. BS1 IS ON.									
	(THIS CONDITION SHOULD NOT BE CHECKED IF ACSE START SIGNAL COMES FROM STUCK BREAKER PROTECTION OF BUS SECTION A OR B)									
	4. BS2 BREAKER IS ON.									
	(THIS CONDITION SHOULD NOT BE CHECKED IF STUCK BREAKER PROTECTION OF BUS SECTION B OR C OPERATES.)									
E	OR ELSE									
	SIMILAR SET OF LOGICS IF GT3 INITIATES 'ACSE START' SIGNAL									
	OR ELSE									
	SIMILAR SET OF LOGICS IF BS1 INITIATES 'ACSE START' SIGNAL									
F	OR ELSE									
	SIMILAR SET OF LOGICS IF BS2 INITIATES 'ACSE START' SIGNAL									
G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		LOGIC DIAGRAM +ACSE TOP		الشركة الوطنية لنقل الكهرباء National Grid sa	
			DRAWN BY RIZ CHECKED BY KVR		132/13.2 kV AUTOCHANGEOVER SWITCHING EQUIPT=ACSE		132/13.2 kV AUTOCHANGEOVER SWITCHING EQUIPT=ACSE		INDEX PLANT NO. DRAWING NUMBER SHEET NO. REV. NO.	
	00	13 09	FOR APPROVAL		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY		P C421 CD-322961		104 104A 00	
	REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC		RIYADH SAUDI ARABIA		NG/D2-D (2012/01) DMS VECTOR NGD200	

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B																																																																										
C	<p>ACSE LOGIC (APPLICABLE FOR GT2-LVCB-S1205)</p> <p>THE STAND-BY TRANSFORMER(GT2) CAN BE BROUGHT IN ONLY IF THE FOLLOWING CONDITIONS ARE SATISFIED:</p> <ol style="list-style-type: none"><li>1. ACSE IS' IN ' SERVICE</li><li>2. GT2-LVCB (S1205) IS OFF</li><li>3. GT2-MV SWGR-VT MCB ON &amp; VOLTAGE AVAILABLE</li><li>4. GT2 - PROTN. TRIP RELAYS RESET</li><li>5. SEC-B STUCK BREAKER PROTECTION NOT OPERATED</li><li>6. ALL THE BREAKERS ARE IN SERVICE POSITION</li></ol> <p>EITHER</p> <ol style="list-style-type: none"><li>1. GT3 - MV SWGR - VT MCB ON &amp; VOLTAGE AVAILABLE &amp; GT3 INCOMER BREAKER IS ON.</li><li>2. GT1 RECEIVES 'ACSE START' SIGNAL AND GT1 BREAKER IS OFF.</li><li>3. BS1 IS ON. (THIS CONDITION SHOULD NOT BE CHECKED IF ACSE START SIGNAL COMES FROM STUCK BREAKER PROTECTION OF BUS SECTION A OR B )</li><li>4. BS2 BREAKER IS ON. (THIS CONDITION SHOULD NOT BE CHECKED IF STUCK BREAKER PROTECTION OF BUS SECTION B OR C OPERATES.)</li></ol> <p>OR ELSE</p> <p>SIMILAR SET OF LOGICS IF GT3 INITIATES 'ACSE START' SIGNAL</p> <p>OR ELSE</p> <p>SIMILAR SET OF LOGICS IF BS1 INITIATES 'ACSE START' SIGNAL</p> <p>OR ELSE</p> <p>SIMILAR SET OF LOGICS IF BS2 INITIATES 'ACSE START' SIGNAL</p>																																																																									
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B	<p>ACSE LOGIC (APPLICABLE FOR GT3-LVCB-S3605)</p> <p>THE STAND-BY TRANSFORMER(GT3) CAN BE BROUGHT IN ONLY IF THE FOLLOWING CONDITIONS ARE SATISFIED:</p> <ol style="list-style-type: none"><li>1. ACSE IS' IN ' SERVICE</li><li>2. GT3-LVCB (S3605) IS OFF</li><li>3. GT3-MV SWGR-VT MCB ON &amp; VOLTAGE AVAILABLE</li><li>4. GT3 - PROTN. TRIP RELAYS RESET</li><li>5. SEC-C STUCK BREAKER PROTECTION NOT OPERATED</li><li>6. ALL THE BREAKERS ARE IN SERVICE POSITION</li></ol>																																																														
C	<p>EITHER</p> <ol style="list-style-type: none"><li>1. GT2 - MV SWGR - VT MCB ON &amp; VOLTAGE AVAILABLE &amp; GT2 INCOMER BREAKER IS ON.</li><li>2. GT1 RECEIVES 'ACSE START' SIGNAL AND GT1 BREAKER IS OFF.</li><li>3. BS1 IS ON.</li></ol> <p>(THIS CONDITION SHOULD NOT BE CHECKED IF ACSE START SIGNAL COMES FROM STUCK BREAKER PROTECTION OF BUS SECTION A OR B)</p> <ol style="list-style-type: none"><li>4. BS2 BREAKER IS ON.</li></ol> <p>(THIS CONDITION SHOULD NOT BE CHECKED IF STUCK BREAKER PROTECTION OF BUS SECTION B OR C OPERATES.)</p> <p>OR ELSE</p> <p>SIMILAR SET OF LOGICS IF GT3 INITIATES 'ACSE START' SIGNAL</p> <p>OR ELSE</p> <p>SIMILAR SET OF LOGICS IF BS1 INITIATES 'ACSE START' SIGNAL</p> <p>OR ELSE</p> <p>SIMILAR SET OF LOGICS IF BS2 INITIATES 'ACSE START' SIGNAL</p>																																																														
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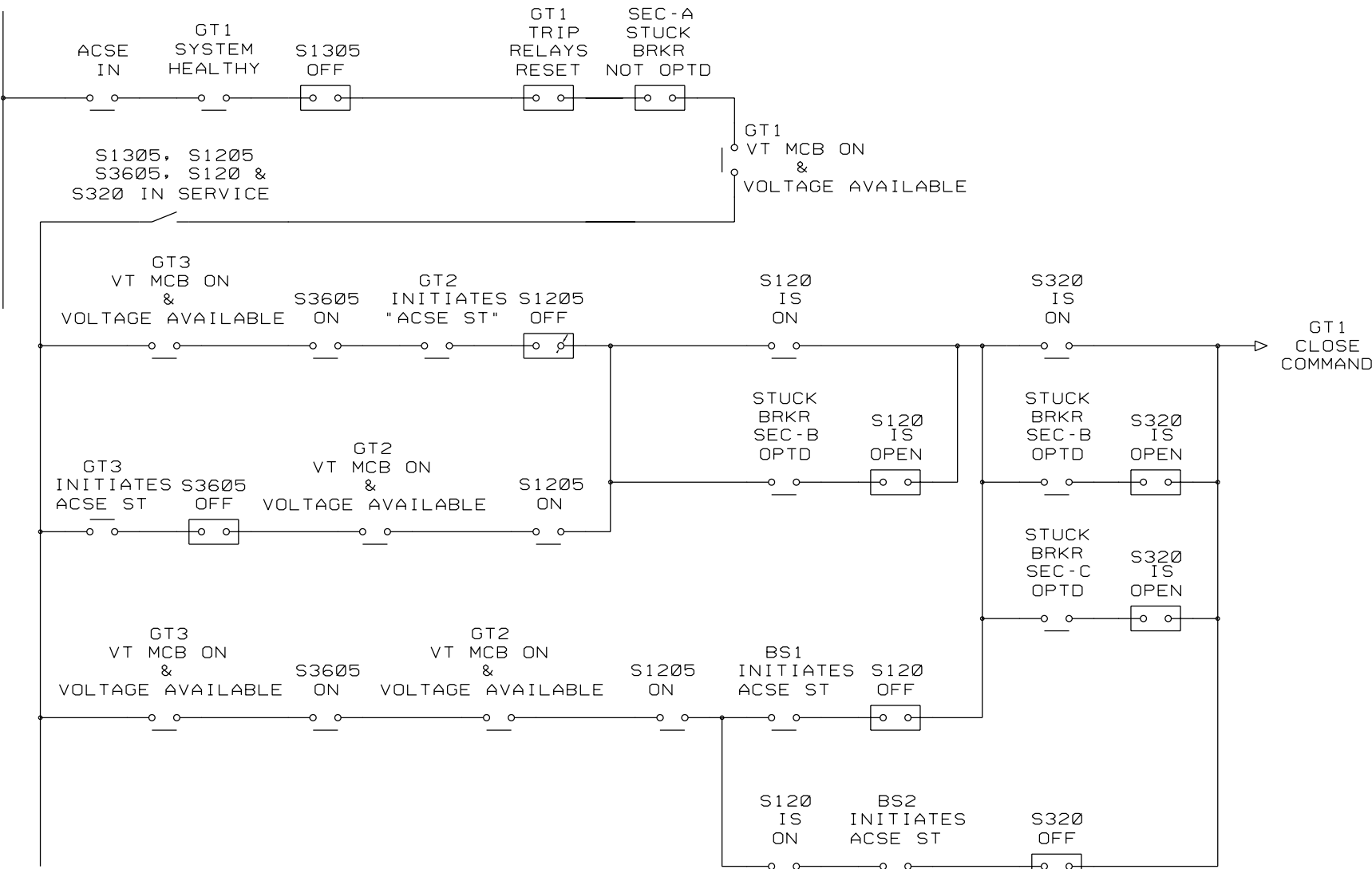
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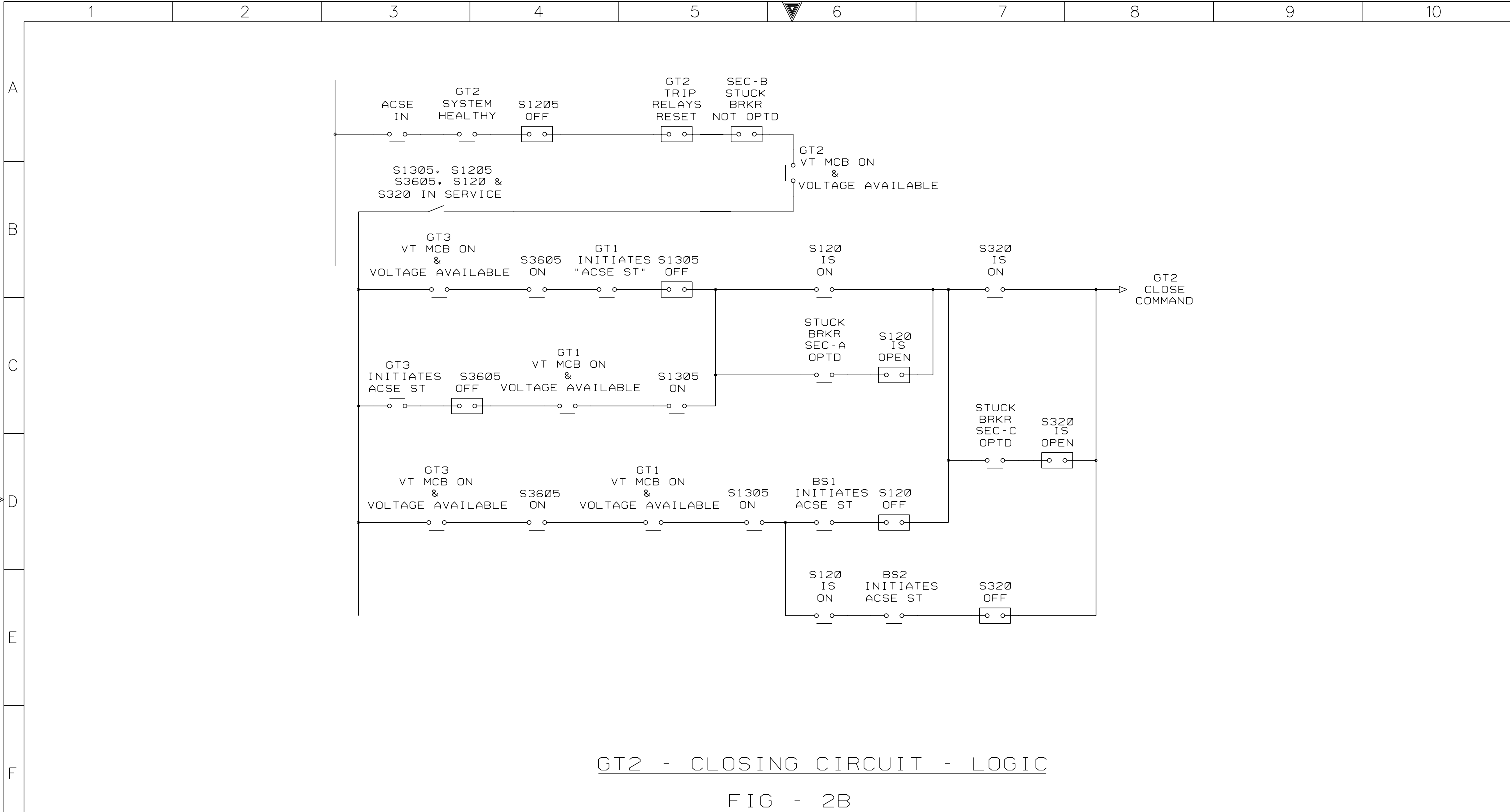



GT1 - CLOSING CIRCUIT - LOGIC

FIG - 2A

G

AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		LOGIC DIAGRAM +ACSE TOP		<div><div>الشركة الوطنية لنقل الكهرباء</div><div>نقل الكهرباء</div><div>National Grid SA</div></div>									
			DRAWN BY RIZ		CHECKED BY KVR		132/13.2 kV AUTOCHANGEOVER SWITCHING EQUIPT=ACSE											
			DATE STARTED 2.22.2013		DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY											
00	13 09	FOR APPROVAL		OPRG. DEPT. CTPD		ENG. DEPT. AUT-PSAC		RIYADH		SAUDI ARABIA		INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.		REV. NO.
REV. NO.	DATE	DESCRIPTION								P	C421	CD-322961		SHT		CONT.	00	
														105		105A		



G	AS-BUILT BY _____ DATE _____		CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		LOGIC DIAGRAM +ACSE TOP		<div>الشركة الوطنية لنقل الكهرباء</div> <div> <b>نقل الكهرباء</b> National Grid sa</div>			
				DRAWN BY <u>RIZ</u> CHECKED BY <u>KVR</u>		132/13.2 kV AUTOCHANGEOVER SWITCHING EQUIPT=ACSE						
				DATE STARTED <u>2.22.2013</u> DATE COMPLETED _____		S/S 8709 - 132/13.8KV IN AL-KHARJ CITY						
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REV. NO.	DATE	DESCRIPTION					P	C421	CD-322961	SHT	CONT.	
										105A	105B	00

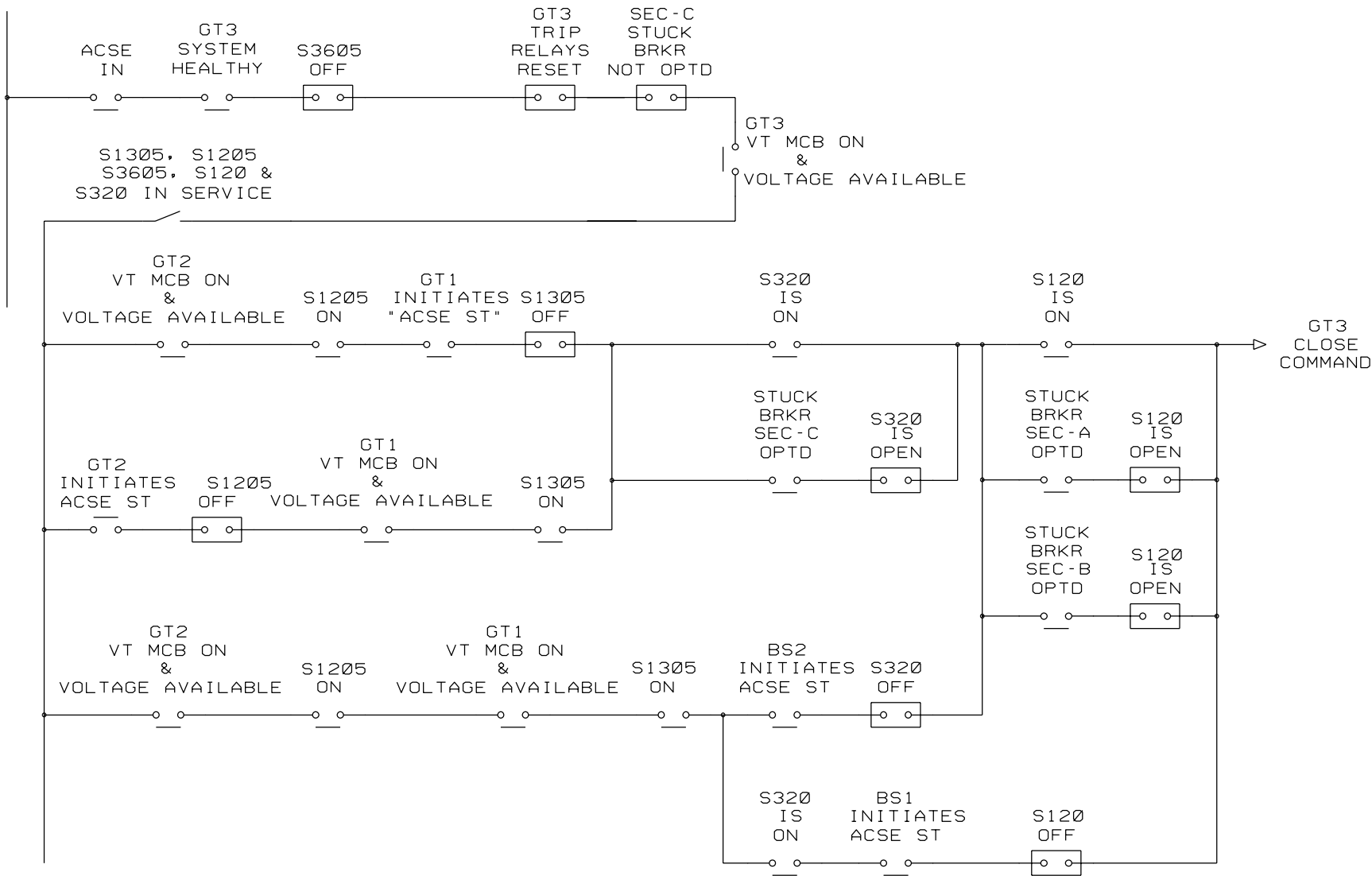
NG/D2-D (2012/01)

DMS

VECTOR

NGD200





AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656		LOGIC DIAGRAM +ACSE TOP		<div>الشركة الوطنية لنقل الكهرباء</div> <div>نقل الكهرباء</div> <div>National Grid sa</div>					
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REV. NO.	DATE	DESCRIPTION		OPRG. DEPT. <u>CTPD</u> ENG. DEPT. <u>AUT-PSAC</u>		RIYADH SAUDI ARABIA		P	C421	CD-322961		SHT 105B CONT. 105C		00

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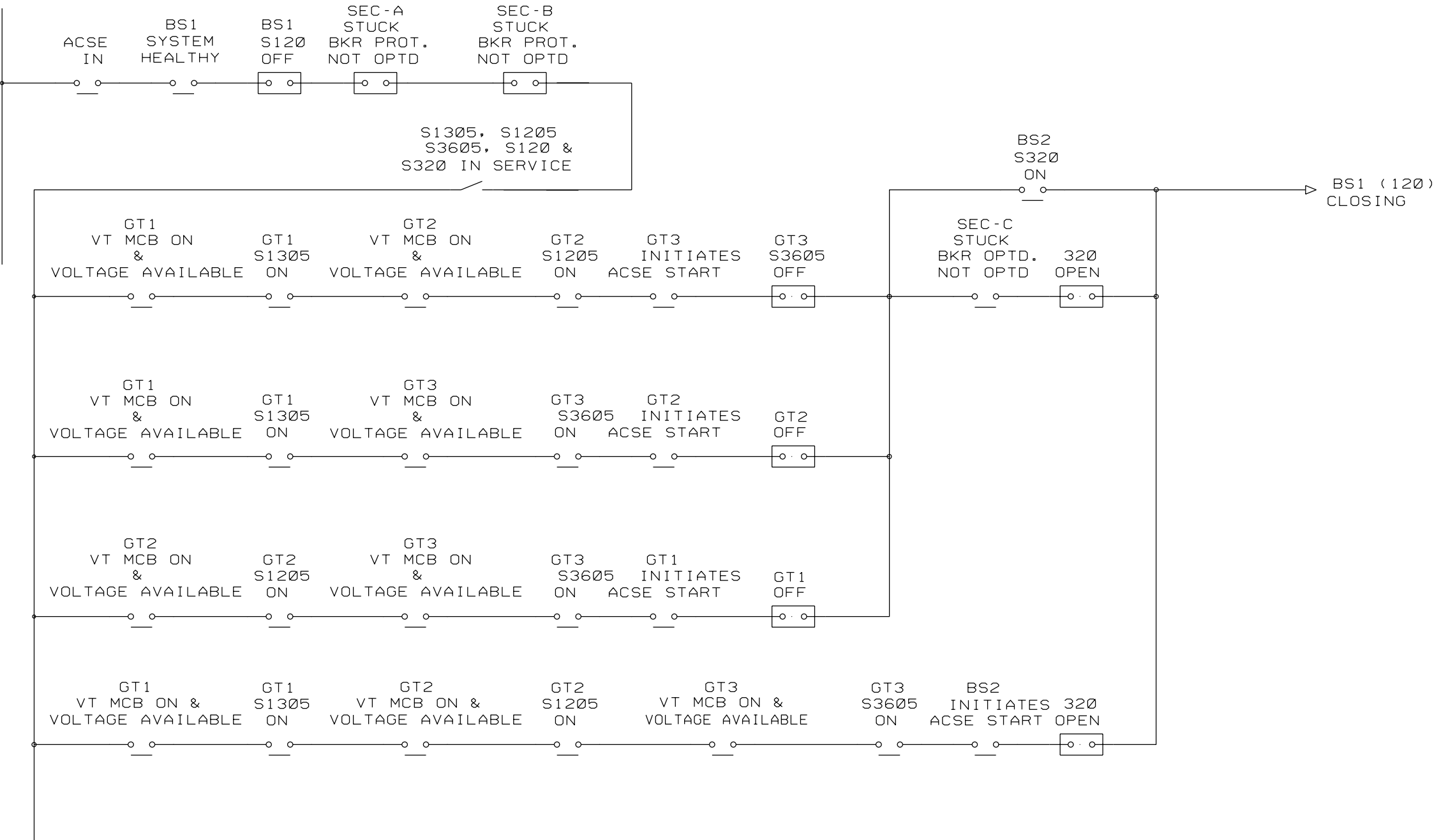
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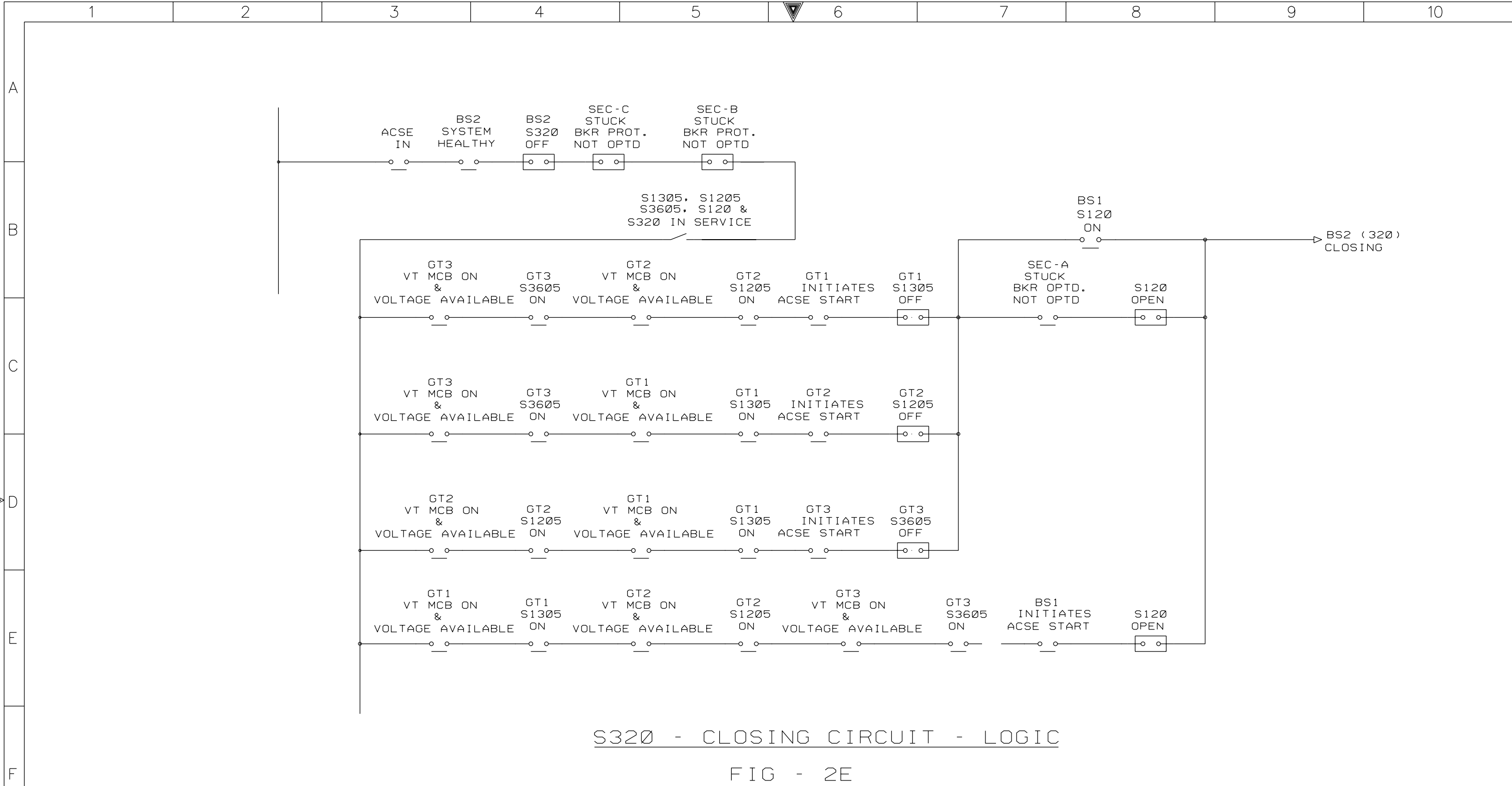
S120 - CLOSING CIRCUIT - LOGIC

FIG - 2D


G

AS-BUILT BY _____ DATE _____			CONTRACT NO. 11131113/00		JOB ORDER NO. S-13656	
			DRAWN BY <u>  RIZ  </u> CHECKED BY <u>  KVR  </u>			
			DATE STARTED <u>2.22.2013</u> DATE COMPLETED _____			
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REV. NO.	DATE	DESCRIPTION				

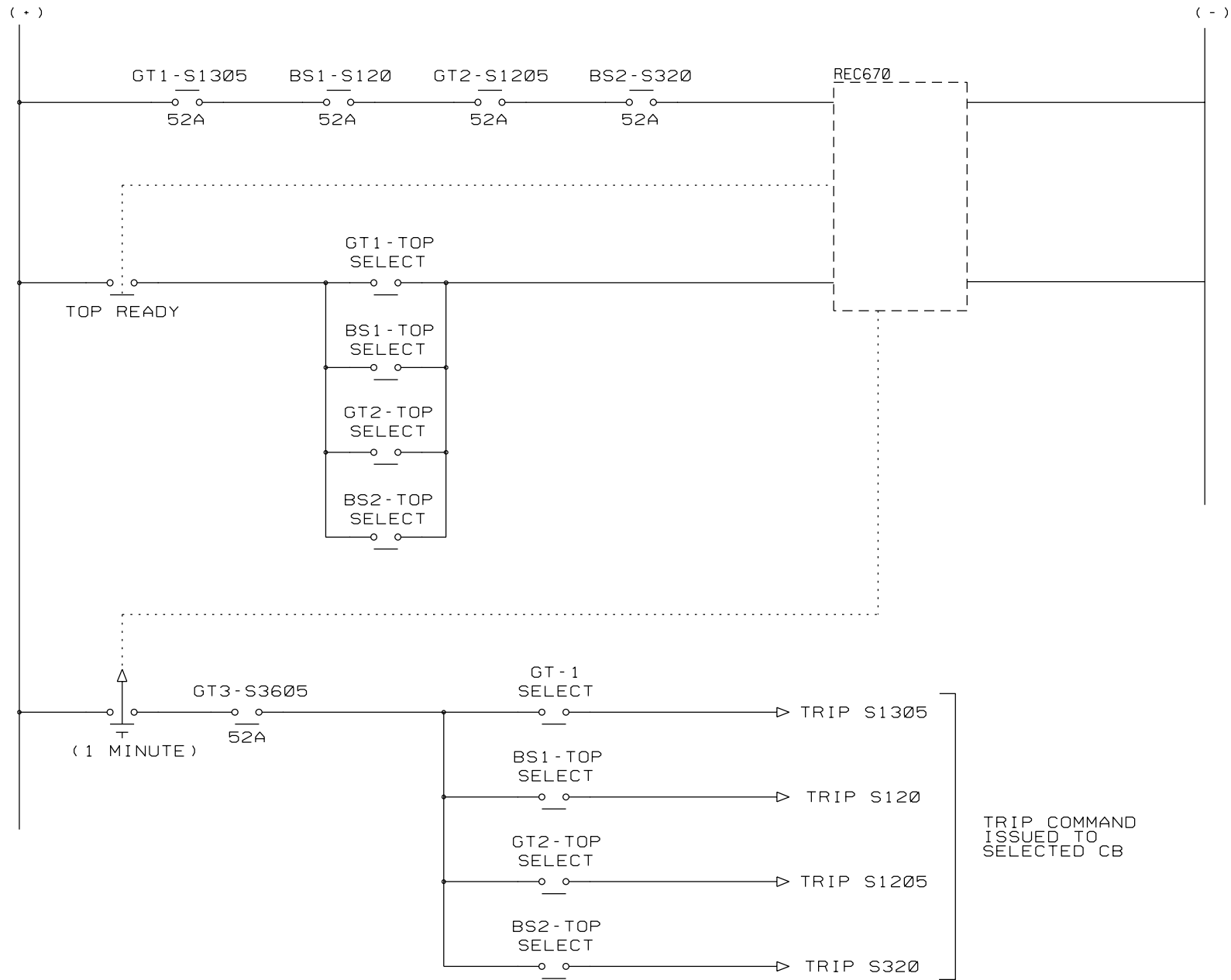
LOGIC DIAGRAM +ACSE TOP						
132/13.2 kV AUTOCHANGEOVER SWITCHING EQUIPT-ACSE						
S/S 8709 - 132/13.8KV IN AL-KHARJ CITY						
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							SAUDI ARABIA							
<u>00</u>	<u>13 09</u>	FOR APPROVAL						INDEX	PLANT NO.	DRAWING NUMBER		SHEET NO.		REV. NO.
REV. NO.	DATE	DESCRIPTION						P	C421	CD-322961		SHT	CONT.	
												1050	105E	00

TRIP ON PARALLEL LOGIC DIAGRAM



TRIP COMMAND  
ISSUED TO  
SELECTED CB

- INITIAL CONDITION: GT3 CB S3605 OPEN
- GT1,GT-2,BS1 & BS2 CBS ARE CLOSED
  - TOP IS SELECTED FOR GT1 OR GT2 OR BS1 OR BS2
  - ALL FIVE 13.8KV FEEDER ARE IN SERVICE POSITION AND SELECTOR ON REMOTE (AT SWITCHGEAR)
- LOGIC
- IF GT3 CB CLOSED MANUALLY, THE SELECTED CB WILL TRIP AFTER I MINUTE
  - SIMILAR LOGIC IS APPLICABLE FOR ALL OTHER BREAKERS

AS-BUILT BY \_\_\_\_\_ DATE \_\_\_\_\_ CONTRACT NO. 11131113/00 JOB ORDER NO. S-13656

LOGIC DIAGRAM +ACSE TOP

00	13 09	FOR APPROVAL
REV. NO.	DATE	DESCRIPTION

DRAWN BY RIZ CHECKED BY KVR

DATE STARTED 2.22.2013 DATE COMPLETED \_\_\_\_\_

OPRG. DEPT. CTPD ENG. DEPT. AUT-PSAC

132/13.2 kV AUTOCHANGEOVER SWITCHING EQUIPT-ACSE

S/S 8709 - 132/13.8KV IN AL-KHARJ CITY

RIYADH SAUDI ARABIA

الشركة الوطنية لنقل الكهرباء

نقل الكهرباء

National Grid sa

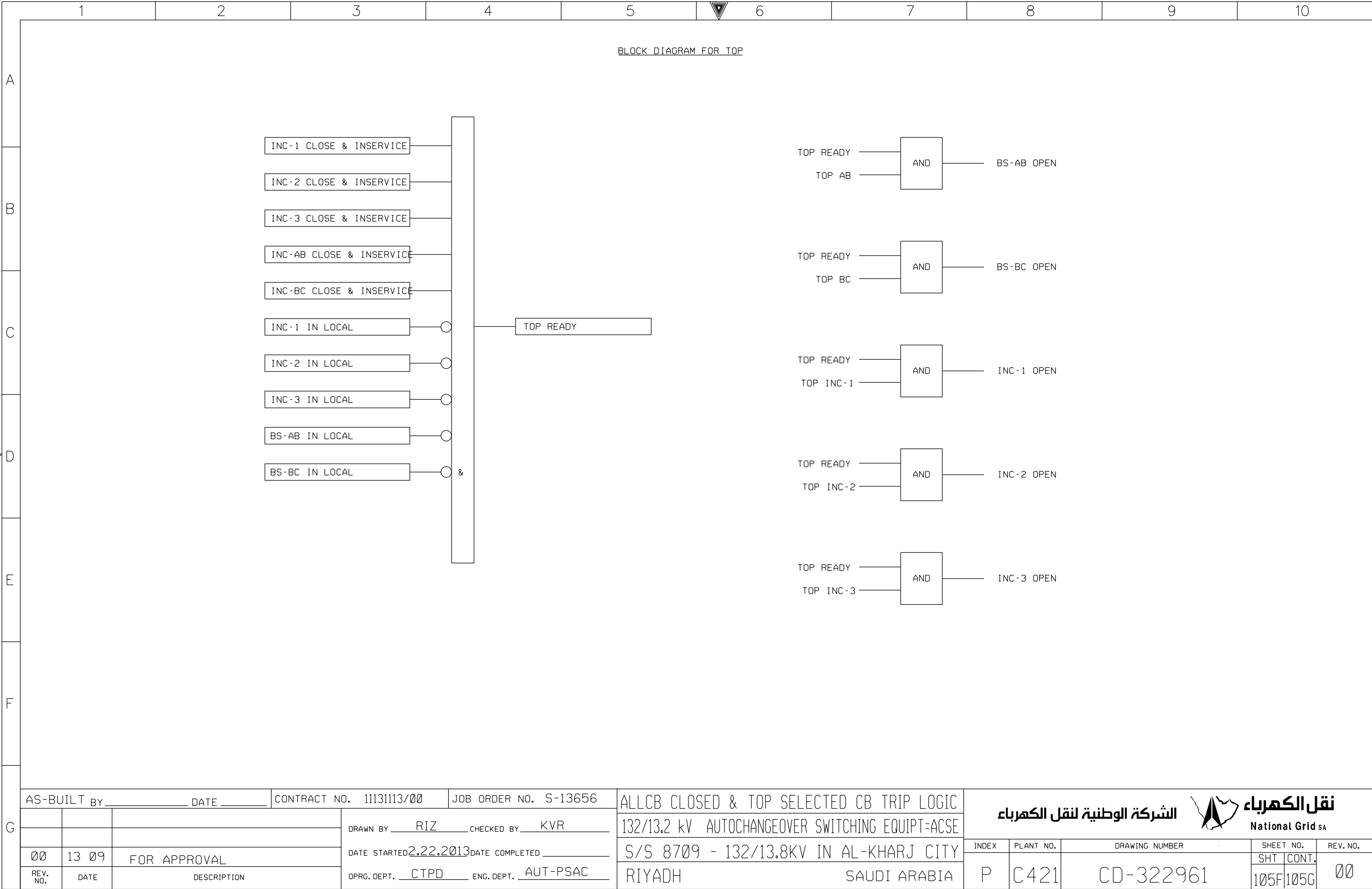
INDEX	PLANT NO.	DRAWING NUMBER	SHEET NO.		REV. NO.
P	C421	CD-322961	SHT	CONT.	00
			105E	105F	




NG/D2-D (2012/01)

DMS

VECTOR

NGD200



	1	2	3	4	5	6	7	8	9	10																																																													
A																																																																							
B	<div><div><div><div><div><div></div><div>INC - 1</div></div><div></div><div>BUS "A"</div></div><div><div><div></div><div>BS - AB</div></div><div>BUS "B"</div><div><div><div></div><div>INC - 2</div></div><div></div><div>BUS "C"</div></div><div><div><div></div><div>BS - BC</div></div><div></div><div><div><div></div><div>INC - 3</div></div><div></div></div></div></div></div></div></div>																																																																						
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E	<div><div><div>1. THE INITIAL CONDITION FOR MANUAL CLOSING OF HOT STANDBY BRK/ANY ONE OUT OF FIVE BRK BY TOP PUSH BUTTON ARE FOUR BRKS OUT OF FIVE BRK SHALL BE CLOSED IN CLOSED POTION. ALL FIVE BRKS. ARE IN SERVICE AND NOT IN LOCAL FROM SWITCH GEAR.</div><div>2. THE INITIAL CONDITION FOR OPENING OF AMY BRK.<div><div>A. ALL FIVE BRKS ARE IN SERVICE AND CLOSED POSITION.</div><div>B. THE SELECTED BRK. OUT OF FIVE FROM TOP SELECTOR SWITCH OPEN AFTER 45SEC. IN OUR CASE INCOMER-3 IS OPEN AND OTHER FOUR ARE CLOSED. LOGIC : INCOMER-3 IS CLOSED MANUALLY, THE SELECTED CB FROM TOP SELECTOR SWITCH WILL OPEN AFTER 45 SEC</div></div></div></div><div>NOTE : SIMILAR LOGIC APPLICABLE FOR OTHER BRKS.</div></div>																																																																						
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1. THE ACSE WILL BE DESIGNED SO THET MAXIMUM 4 CB'S CAN PARALLED AT ANY TIME.
2. IF ALL 5 CB'S ARE CLOSED FOR 30SEC. AT ANY CONDITION ACSE WILL TRIP BS-BC AFTER DEFINE TIME OF T SEC \*.
- \* - ADJUSTABLE

(T: 0--->650MS\*)

TIMER SETTING RANGE  
FROM 0 TO 650MS